REMARKS

Claims 1-11 and 14-20 are pending in this application. Claim 1 is an independent claim. Claims 1, 3-5, 10-11 and 14 are amended. Claim 2, 15 and 19-20 are cancelled without any intent of prejudice to or disclaimer of the subject matter contained therein. Claims 12 and 13 were previously cancelled. Reconsideration and allowance of the present application are respectfully requested.

Entry of Amendment After Final Rejection

Entry of the Amendment is requested under 37 C.F.R. § 1.116 because the Amendment: a) places the application in condition for allowance for the reasons discussed herein; b) does not present any additional claims without canceling the corresponding number of final rejected claims; and/or c) places the application in better form for an appeal, if an appeal is necessary. Entry of the Amendment is thus respectfully requested.

Claim Objections

Claim 10 is objected as the Examiner asserts that the method of claim 10 cannot depend on the method of claim 9 and the device of claim 2, as claim 9 already sets forth the use of the device of claim 1. Accordingly, Applicant amends claim 10 to only depend from claim 9.

Claims 19 and 20 are objected to under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant cancels claims 19 and 20.

Rejections under 35 U.S.C. §112, Second Paragraph

Claims 1-11 and 14-20 stand rejected under 35 USC §112, second paragraph, as being indefinite. This rejection is respectfully traversed.

With regard to claim 1, the Examiner asserts that the phrase "such as" renders the claim indefinite. Applicant amends claim 1 by inserting the word "including" to replace the phrase "such as." Applicant therefore believes that each of claims 1-11 and 14-20 are definite as they particularly point out and distinctly claim the subject matter which Applicant regards the invention. Therefore, Applicant respectfully requests that the rejections of these claims under 35 U.S.C. §112 be withdrawn.

Rejections under 35 U.S.C. §103 – *Robinson in view of Barker*

Claims 1-5, 8-11, and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 727,691 ("Robinson") in view of U.S. Patent 3,739,503 ("Barker"). This rejection is respectfully traversed.

With regard to independent claim 1, the Examiner asserts that Robinson discloses all of the claim limitations with the exception that Robinson does not disclose alternatively mounting a second cutter head on the drive shaft for use on relatively hard material. The Examiner asserts that Barker discloses different cutter heads 159, 203, 204 that are alternatively mounted on a same drive means 157. The Examiner asserts that it would have been obvious for a person of ordinary skill in the art to improve the device of Robinson by using the alternatively mountable head of Barker.

With regard to Robinson, Applicant submits that Robinson pertains to a cutter head for dredges operated in clay or sticky material that does not clog, as described in lines 22-29 and 19-24 of Robinson. As shown in FIG. 2, and as described in lines 37-

43 of Robinson, the ring or annular part M is formed in the Robinson cutter head to provide less resistance caused by the clay-like excavating material by dividing the excavated material into two streams. As described in page 2, lines 6-43, a "multiple-mouth suction-pipe" P/Q is therefore provided, as a dual suction mouth, to remove the two streams of excavated material created by annular part M. Applicant therefore asserts that Robinson does not teach or suggest "*alternatively connectable*" suction mouths, as recited in claim 1, as Robinson instead only discloses a dual suction mouth to remove the two streams of excavated material created by annular part M. For at this reason, Applicant asserts that Robinson does not teach or suggest "a number of suction mouths with a different entry section which are *alternatively connectable to the suction pipe*, *a first section mouth* of said number of suction mouths being configured for a relatively hard bed material, including rock, and being sized to cooperate with said first cutter head, and *a second suction mouth* of said number of suction mouths being configured for a relatively soft bed material, including sand, and being sized to cooperate with said second cutter head," as recited in claim 1. Applicant asserts that a review of Barker indicates that Barker does not remedy this stated deficiency of Robinson, nor does the Examiner rely on Barker for this reason.

Applicant further asserts that Robinson in view of Barker does not teach or suggest "a drive shaft mounted therein for rotatingly driving with a determined torque a cutter head with a support ring, which cutter head is mountable on the drive shaft via a hub... *said number of cutter heads being alternatively mountable via the same hub on the drive shaft*," as recited in claim 1. Applicant draws the Examiner's attention to FIGS. 7, and 9-10 of Barker which show the use of entirely different types of lower end digging devices which are mountable on a common suction pipe 157. Specifically, Barker discloses the use of a venturi-jet pump 203, a cutter head 159, and a digging

device 204. Each of these lower end digging devices is entirely different from each other, and only one of the digging devices is a cutter head (and, the cutter head is the only digging instrument with a "drive shaft," as recited in claim 1). Furthermore, FIGS. 7, and 9-10 do not show alternatively mountable cutter heads on "*the same hub on the drive shaft*," as recited in claim 1. Rather, Barker only shows a common *suction pipe 157*, and a common *suction pipe* is not a "*hub on a drive shaft*," as recited in claim 1. Applicant therefore asserts that because Barker only discloses swapping out an entire lower end digging device, and because Barker does not teach or suggest a common "hub" on a drive shaft that may otherwise accept alternatively mountable cutter heads, Applicant therefore asserts that Barker does not teach or suggest "a drive shaft mounted therein for rotatingly driving with a determined torque a cutter head with a support ring, which cutter head is mountable on the drive shaft via a hub... *said number of cutter heads being alternatively mountable via the same hub on the drive shaft*," as recited in claim 1. Applicant asserts that a review of Robinson indicates that Robinson does not remedy this deficiency of Barker, nor does the Examiner rely on Robinson for this reason.

Applicant further asserts that Robinson in view of Barker does not teach or suggest "*wherein the first support ring diameter is smaller than the second support ring diameter, the first support ring diameter being determined for a relatively hard bed material and the second support ring diameter being determined for a relatively soft bed material*," as recited in claim 1.

With regard to claim 5, Applicant asserts that Robinson in view of Barker does not teach or suggest "the first and second cutter shield each have a cylindrical inner surface fitting around the cylindrical outer surface of the bearing housing, and a bottom outer surface in the form of a truncated cone narrowing in the direction of the

bottom end of the bearing housing," as recited in claim 5. With regard to the cutter shields E of Robinson, the cutter shields take the form of a truncated cone having an opening as shown in FIG. 4. However, the use of the truncated cone shape in cutter shield E is exactly opposite of that recited in claim 5. Applicant asserts that Barker does not remedy this deficiency of Robinson, nor does the Examiner rely on Barker for this reason.

Also with regard to claim 5, Applicant asserts that Robinson in view of Barker does not teach or suggest "the bottom outer surface of the first cutter shield, in the mounted position thereof, extending between the bottom end of the bearing housing and the front end of the cutter ladder, the bottom outer surface of the second cutter shield, in the mounted position thereof, extending between the bottom end of the bearing housing and the second support ring," as recited in claim 5.

With regard to independent claim 1 and dependent claim 5, Applicant asserts that these claims are patentable. Due at least to the dependence of claims 2-4, 8-11 and 14 on claim 1. Applicant also asserts that these claims are patentable. Therefore, Applicant respectfully requests that this art ground of rejection of these claims under 35 U.S.C. §103 be withdrawn.

Rejections under 35 U.S.C. §103 – *Robinson in view of Barker and further in view of Huff*

Claims 6, 7, and 15-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Robinson in view of Barker as applied to claim 1 above, and further in view of U.S. Patent 2,678,203 ("Huff"). This rejection is respectfully traversed.

Initially, Applicant asserts that a person of ordinary skill in the art would not be motivated to combine Huff with either Robinson or Barker. Specifically, Huff relates to

a hydraulic jet cutting and pumping apparatus for mining hydrocarbonaceous solids, which is a completely different device from the digging tools (i.e., the "cutter heads") of Robinson and Barker. Contrarily, Huff only discloses a pump with a rotatable shaft 16 for withdrawing solid material that is dislodged by jet nozzles 15, the jet mozzles 15 being fed by a high pressure water conduit 14 running through rotatable shaft 16. Therefore, Applicant asserts that a person of ordinary skill in the art would not be motivated to combine the combination pump and jet nozzles of Huff, which dislodge material solely through the use of the jet nozzles, with the digging tools of either Robinson or Barker in the manner asserted by the Examiner.

Specifically with regard to claim 7, Applicant further asserts that a person of ordinary skill in the art would not be motivated to combine the conduit 14 of Huff with either of the "cutter heads" of Robinson or Barker. Huff discloses the use of conduit 14 to provide pressurized fluid through rotatable shaft 16 to jet nozzles 15. The apparatus of Huff operates by allowing the jet nozzles 15 to dislodge solids while mining, such that solid material is then removed via a centrifugal type pump. None of these components of Huff are applicable to the drive shaft and cutter heads of either Robinson or Barker. Specifically, no portion of Robinson, Barker, or Huff teaches or suggests combining a conduit 14, as disclosed by Huff, with a drive shaft of a cutter head as shown in Robinson and Barker. More specifically, while the conduit 16 of Huff is combined with jet nozzles and a centrifugal pump to provide high pressure fluid to the tip of the Huff apparatus so that the material may then removed via the pump, no portion of Huff suggests combining such a conduit with a digging tool such as a cutter head. Therefore, Applicant asserts that a person of ordinary skill in the art would not be motivated to combine Huff with either Robinson or Barker in order to teach or suggest "wherein the drive shaft takes a hollow form in order *to form a*

channel for the fluid under pressure, wherein the at least one nozzle is mounted on the outer end of the drive shaft connected to the cutter head," as recited in claim 7.

For at least the reasons stated above related to claims 6-7 and 15-20, Applicant asserts that these claims are patentable. Therefore, Applicant respectfully requests that this art ground of rejection of these claims under 35 U.S.C. §103 be withdrawn.

New Claims

Applicant adds new claims 21-24. Applicant asserts that the limitations of these claims are patentable over any and all combination of Robinson, Barker and Huff.

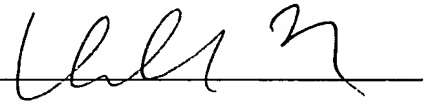
CONCLUSION

In view of the above remarks and amendments, Applicant respectfully submits that each of the rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,
HARNESS, DICKEY, & PIERCE, P.L.C.

By 
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